Claims

1. In an agricultural implement including at least one rotary driven tool, a drive coupled to said rotary driven tool including a slip clutch, the improvement comprising: said slip clutch including first and second sections arranged concentrically to and adapted for rotation about an axis; said first section including a fluid tight container adapted for containing a liquid coolant and having at least one end plate; a friction disk mounted to said second section for rotation therewith and for movement toward and away from said at least one end plate; a biasing arrangement mounted to said second section for rotation with said friction disc and being mounted for yieldably frictionally locking said friction disk in engagement with said at least one end plate with a predetermined axial force, whereby when said clutch is overloaded said friction disk and at least one end plate will rotate relative to each other and will generate heat that is dissipated by said liquid coolant.

2. The agricultural implement defined in claim 1 wherein said fluid tight container is spaced radially inward from a cylindrical wall of said second section to thereby form an annular space between said fluid tight container and said cylindrical wall so as to aid in heat dissipation.

3. The agricultural implement defined in claim 2 wherein the mounting of said friction disk to said second section includes a disk-like backing plate fixed to said friction disk and having axially extending tabs at its periphery; and said cylindrical wall being provided with axial slots receiving said tabs for permitting the backing plate, and hence said friction disk, to move axially but not rotationally relative to said housing.

4. The agricultural implement defined in claim 1 wherein said fluid tight container has opposite ends defining said at least one end plate and a second end plate and said second section having a second friction disc mounted thereto for rotation therewith while fixing it axially at a location engaged with said second end plate; and said first section being mounted for axial movement toward and away from said second section, whereby said biasing arrangement also maintains a locking engagement of said second friction disc with said second end plate with a predetermined axial force.

5. The agricultural implement defined in claim 4 wherein said second section includes a hub at one end which defines an annular surface facing toward said second end plate; said mounting of said at least one and second friction disks respectively including first and second disk-like backing plates each being provided with axially extending tabs at their respective peripheries; said second section having a cylindrical wall spaced radially outward

from said fluid tight container so as to define an annular space between said cylindrical wall and said container; and said cylindrical wall being provided with axially extending slots receiving said tabs for axial movement therein but so as to prevent relative rotational movement of said backing plates.

6. The agricultural implement as defined in claim 5 wherein said second section includes a hub at one end which is fixed to said cylindrical wall; and said second friction disk and backing plate being sandwiched between said second endplate and said hub.

7. The agricultural implement as defined in claim 1 and including a second rotary driven tool adapted for being driven separately from said first-named rotary driven tool; a second drive coupled for driving said second rotary driven tool and including a second slip clutch identical in construction to said first-mentioned slip clutch; and a drive shaft arrangement extending axially through said first-named and second slip clutches and including respective drive connections with said first clutch sections of said first-named and second slip clutches, with said first clutch sections respectively being coupled for driving said second clutch sections of said first-named and second slip clutches through said at least one friction disk of each clutch.

8. The agricultural implement as defined in claim 7 wherein said first-named and second slip clutches are arranged in symmetrical fashion relative to a vertical center plane extending therebetween in perpendicular relationship to the axis of rotation of the clutches; and said second section of each of said clutches having a hub formed at one end; and the drive for the first-named rotary driven tool including a first angle drive having an input shaft arranged concentric to said drive shaft arrangement and coupled to said first angle drive; and the drive for said second rotary driven tool including a second angle drive having an input shaft arranged concentric to said drive shaft arrangement and coupled to said hub of said second section of said second clutch.

9. A slip clutch for use in an agricultural implement, comprising: first and second clutch sections having a rotational axis; said first clutch section defining a fluid-tight container having at least a disk-like first end plate disposed perpendicular to said axis; a friction disk mounted to said second clutch section for rotation therewith and for axial movement toward and away from said first end plate; a biasing arrangement urging said friction disk into locked friction engagement with said first end plate with a predetermined engaging force, whereby, upon said slip clutch experiencing an overload said friction disk will slip relative to said end plate thus generating heat which is dissipated by liquid coolant contained in said fluid-tight container.

10. The slip clutch defined in claim 9 wherein said fluid-tight container has a disk-like second end plate located at an opposite end thereof from said first end plate; and a second friction disk being mounted for rotation with said second clutch section and in friction locked engagement with said second disk-like end plate; and said first clutch section being mounted for axial movement toward said second friction disk, whereby said biasing arrangement serves also to keep said second friction disk engaged with said second end plate with said predetermined force.

11. The slip clutch as defined in claim 9 wherein said second clutch section includes a cylindrical housing surrounding said fluid-tight container and including a housing portion extending axially beyond said first end plate; said biasing arrangement including an annular spring retainer mounted within said housing portion of said cylindrical housing; and a plurality of coil compression springs mounted between said spring retainer and said at least one friction disk.

12. The slip clutch as defined in claim 9 wherein said second clutch section includes a cylindrical housing spaced radially outward from said first clutch section and provided with a plurality of axially extending openings; said one friction disk being fixed to an annular backing plate which includes a plurality of axially extending tabs respectively located in said plurality of axially extending openings, whereby said friction disk is mounted for axial movement toward and away from said first end plate while being coupled for rotation with said second clutch section.

13. The slip clutch as defined in claim 9 wherein said liquid container is generally cylindrical; a cylindrical sleeve extending through said end plate and terminating inside said container; said container having a second end plate disposed in parallel relationship to said first end plate; a stub shaft extending through said second end plate and being fixed to an end of said cylindrical sleeve and to said second end plate; said second clutch section including a ring-like hub disposed in concentric relationship to that part of the cylindrical sleeve that is located outside said liquid container; and said stub shaft including a section located outside said liquid container which is provided with connection splines about its exterior, said cylindrical sleeve is provided with internal connection splines and said hub is provided with connection splines on its interior, whereby said cylindrical sleeve is adapted for being connected to a power input shaft, said ring-like hub establishes an output adapted for being connected to driven element and said stub shaft being adapted for transferring input power beyond said slip clutch.

15. The slip clutch as defined in claim 9 wherein said liquid container is generally

cylindrical; said clutch housing having a cylindrical wall disposed in concentric relationship to and spaced from said container so as to define an annular void between the container and the housing; and said cylindrical wall being provided with a plurality of openings through which heat generated by relative movement between said friction disk and end plate when the clutch is overloaded and slips.

16. A slip clutch arrangement for driving separate driven crop processing elements at opposite sides of an implement, comprising: said clutch slip clutch arrangement including identical first and second slip clutches arranged as mirror images with each other relative to a vertical plane; each slip clutch including first and second concentric sections mounted for rotation about a drive axis; each first section including a drive shaft element mounted along said drive axis and having integral first and second portions respectively adapted for being coupled to an input shaft and to an intermediate drive shaft section extending between said first and second slip clutches; each first clutch section including at least one circular plate disposed for rotation about said drive axis and being coupled to said drive shaft element; a friction disk element being in contact with said circular plate and being mounted for rotation with said second clutch section and for axial movement relative to said circular plate; a spring assembly mounted to said second clutch section and biasing said friction disk element into friction engagement with said circular plate; and each second section including a ring-like hub at one end adapted for connection to a drive component leading to a respective one of said separate crop processing elements.

17. The slip clutch arrangement defined in claim 16 wherein each first clutch section is in the form of a closed container for holding coolant; and said at least one circular plate being an end plate of said container.

18. The slip clutch arrangement defined in claim 17 wherein each second clutch section is in the form of a housing having said ring-like hub at one end.

19. The slip clutch arrangement defined in claim 18 wherein each housing is a cylindrical housing disposed concentrically to said drive shaft element; and said spring assembly being located within one end of, and mounted to, said housing.

20. The slip clutch arrangement defined in claim 16 wherein the first portion of each drive shaft element is tubular and is fixed to said circular plate, and the second portion of each drive shaft element is in the form of a stub shaft fixed to one end of said first portion.